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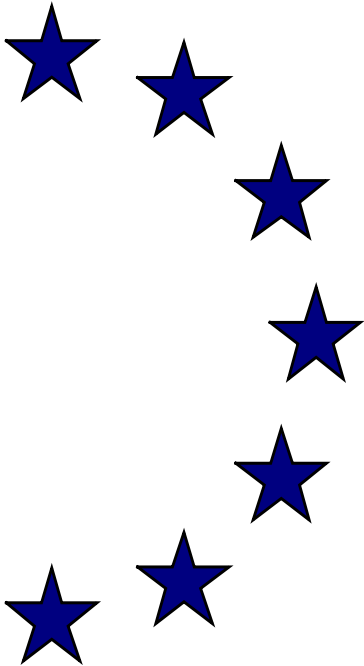
Wage formation and European integration

by

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Wage Formation and European Integration

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European integration is likely to affect labour market performance through various routes. One important channel is the effects product market integration has on labour markets. This paper reviews how product market integration may strengthen labour market interdependencies between integrating economies and therefore affect both the level of employment and the flexibility by which wages adjust to shocks. It is argued that inherent in the integration process are forces which tend to make wage less flexible which implies that more employment variability may follow, even though the average level of employment may increase. Stronger wage inter-dependencies and also nominal convergence may thus be beneficial for both the level of employment and the objective of price stability, but it may come at the cost of greater volatility in employment, that is, nominal convergence but real divergence.

1 Introduction

The characteristics of European labour markets are centre stage to many policy issues. Structural problems causing impediments in the adjustment process are widely perceived to be a key reason for persistent unemployment problems in a number of European countries. Furthermore the formation of the European monetary union is often taken to put further demands on the flexibility of wages to compensate for lack of (national) instruments to deal with asymmetric shocks. In the absence of such increased flexibility asymmetries and differences in labour market performance across European countries may increase, and this may in turn lead to a stronger pressure for monetary policy to be concerned with output stability alongside price stability. However, labour market structures and institutions may adapt as a response to the integration process, and therefore it is necessary to evaluate the mechanisms through which labour markets could be affected by integration to evaluate the need for structural labour market reforms.

At a global level integration is driven by both political decisions and technological changes lowering information and transport costs. In a European perspective the single market, the common monetary policy and the enlargement are all adding to the integration process. For real economic activities, trade statistics confirm that trade flows within Europe have increased rapidly, but EU as an area is not significantly more open to trade with the rest of the world today than it was 40 years ago (OECD (1999)). This indicates the strength or bias of the European integration process relative to possible "globalization forces" in trade of goods and services. The volume of trade in EU now amounts to more than 120% of value added for the manufacturing sector (Andersen, Haldrup and Sørensen (2000)), and it is associated with further specialization (Midelfart-Knarvik et al. 2000). Trade growth is concentrated in intra-industrial trade (OECD (2002)), which is important since it shows an increase in trade in products for which the production is not dependent on access to specific natural resources (as is often the case for inter-industrial trade) or for which it is possible to split-up the value added chain via various forms of outsourcing. Both of the above-mentioned effects imply that the location of production across European countries becomes more sensitive to the profitability of production. Importantly, the increase in trade flows also reflects that the boundary for which commodities and services can be traded across borders is continuously changing, and e.g. service activities which previously were considered non-tradeables are increasingly becoming tradeables (banking, graphical work etc.). A further factor strengthening the above-mentioned mechanisms is the increase in foreign direct investments (see e.g. UNCTAD (2002)). The formation of the European monetary union is expected to be a further catalyst for the ongoing integration process, although the quantitative importance of exchange risk for trade flows and market integration is disputed.

While no significant changes in labour mobility within the EU have yet been observed (OECD (1999)), it is important to point out that changes in product markets induced by international integration may have important implications for labour markets. This link runs via several channels including more competition over market shares in domestic and foreign markets, easier room for relocation of production (outsourcing) across national labour markets, and relocation of firms (FDIs). All of these changes can be summarized as implying that job mobility across European labour markets increases, or to put it differently, the sensitivity of employment to domestic conditions (relative to that of other European countries) increases.[1] Hence, even if labour mobility across

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[1] A separate issue is migration into the current EU-area and enlargement, which is not addressed in this paper.

European labour markets remain quantitatively important, it follows that job mobility is enhanced as a consequence of integration, and therefore labour markets are affected.

The effects of product market integration for labour markets is often summarized as implying that the elasticity of employment to wages increases (Burda (1999), Andersen, Haldrup and Sørensen (2000)), and therefore wage setters face a more steep trade-off between wages and employment, which would induce wage moderation. For this reason it is also often hypothesized that product market integration is alike a structural reform making labour markets more flexible. The argument being that the increased job mobility changes incentives underlying wage formation by reducing the scope for appropriating rents which in turn induce wage moderation.

This paper is an attempt to evaluate to what extent product market integration can be expected to make labour markets more flexible. This involves both a consideration of the implications for the structural unemployment level but also the speed by which wages adjust to various shocks affecting the labour market. The latter issue has been somewhat neglected in the literature[2], but it is important to address whether labour market changes will tend to mitigate or reinforce the sources of asymmetric business cycle developments across countries integrating.

The paper starts out in section 2 by a brief presentation of current institutional changes in EU labour markets, which can be directly related to the integration process. This section also reports some empirical evidence on wage developments across EU countries. The effects of product market integration on structural unemployment are addressed in section 3 and related to the implication they may have for equilibrium employment and therefore the structural unemployment rate. Section 4 turns to the business cycle implications of these structural changes and addresses the implications for the adjustment of wages to shocks, and thereby the volatility of employment. A few concluding remarks are given in section 5. An appendix gives some theoretical results referred to in the text.

2 Institutional and empirical evidence

Casual evidence suggests that a "European" element is playing a larger role in labour markets. Wage setting is often explicitly made with a reference to the "European norm" and the concern to have nominal wage increases to develop in accordance with the overall monetary objective of low and stable inflation. In specific cases it is also quite visible that the improved "exit option" of employers affects labour market bargaining. Restructuring and employment reductions by multinationals like Danone and Marks and Spencer are two examples which attracted substantial media attention. They were widely interpreted as examples of the Europeanisation of labour markets and the flexibility by which firms operating in several European countries can relocate production and thus employment to the advantage of the firm and the disadvantage of the incumbent work force. Another important example is the Volkswagen agreement in 2001, which led to more flexible work conditions and wage moderation. In the latter case it was quite clear that the management explicitly used the argument that production could be relocated if the outcome would not be satisfactory for the management.

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[2] There has been some work done on how a move towards lower inflation might affect wage formation and nominal rigidity, see e.g. Calmfors (2001) for a discussion and references.

This section takes a brief look at institutional and empirical developments in EU labour markets to assess the extent to which European integration can be said to have affected the process of wage determination. The extent to which convergence in actual wage developments can be observed across European labour markets is also addressed.

2.1 Institutional changes

In union circles there has been an increasing recognition of the transnational character of labour market issues, and the fact that the labour market interdependencies are being strengthened due to further European integration. Already in 1973 the European Trade Union Confederation (ETUC) – a networking organisation for unions in European countries – was set up. The aim was to ensure a better representation and louder voice for labour interest in European policy debates and with the objective of preventing any kind of social and wage dumping.

Transnational cooperation is taking place at the sectorial level within European industry federations of which there currently are 11 (Dufresne (2002)). The federations represent workers in various contexts and aim at coordinating wage bargaining. The coordination is through information sharing and comparisons of collective bargaining systems and outcomes. Some are aiming at setting minimum standards and rules as well as quantitative objectives to be followed in national negotiations. Four federations have established their own collective bargaining committees: metal-workers (1993), graphical workers (1995), workers in mining/chemicals/energy (1996) and workers in textile/clothing/ leather (1997) and more may follow (Dufresne (2002)).

At the sectorial level there are also cross-border initiatives where unions from a few countries join effort with a regional perspective to share information and prevent undercutting mechanisms in wages and related issues.

At the European level different steps have been taken to foster a social dialogue on matters related to labour market and social policy issues, and more recently to ensure wage developments in accordance with the overall objective of price stability for EMU member countries (European Commission 2000, 2002)). The social dialogue process was initiated in 1985 with the so-called Val Duchesse process for bipartite bodies at the industry level. These were autonomous endeavours aiming at exchange of information and providing the participants a possibility of issuing opinions. The process has since been formalised and the Treaty now requires (Article 138) that social partners shall be consulted in two stages, namely, both on the need for and the possible direction of community action as well as on its content. The Treaty stipulates (Article 139) that implementation can take place either via voluntary agreement and adoption in national agreements or via the Council in the form of directives.

Directives have been launched on issues like equal treatment, health and safety. An example of a directive leading to an institutional arrangement, which explicitly takes account of increased cross-country activities of firms, is the directive on European work council (EWC). A EU directive from 1994 requires companies employing more than 1000 workers in the EU of which 150 are in at least two member countries to establish a EWC. In 2002 there were 1874 such councils. The councils are a forum for consultation and information sharing on labour issues including cross-border company policy as well as information sharing and consultation. The councils do not play any direct role in wage negotiations.

The Broad Economic Policy guidelines (see e.g. OECD 2002) also include labour market issues stressing the need for nominal wage developments to be in accordance with the inflation objectives and real wage developments to be in

line with productivity. The macroeconomic dialogue is taking place within the Cologne process with participation of social partners, the Council, the Commission and representatives of the ECB with the aim of providing a forum for information exchange among the key macroeconomic actors in the EU.

The Luxembourg process aims at improving the functioning of labour markets. Policy coordination of labour market policies primarily relies on information exchange through monitoring of labour market developments and the sharing of best practices as well as peer pressure to reach certain goals. Accordingly, certain targets have been agreed for, e.g. the employment rate (Lisbon 2000: to be at least 70% by 2010), the employment of old workers (Stockholm 2001: to be at least 50% for the age group 55-64 by 2010) and to reduce early retirement (Barcelona 2002: effective retirement age to increase by 5 years by 2010). The recent Employment Guidelines focus on four pillars (employability, entrepreneurship, adaptability and equal opportunities) on which labour market policies should be built.

European wage norms

The importance of the "European" element in wage formation, that is, the increased focus on competitiveness following from intensified integration is visible in all EU labour markets. In various countries a "European norm" has playedeither an explicit or implicit role in wage formation. An interesting example is the Belgian "law on competitiveness" from 1996 which explicitly linked wage increase to wage increases for its main competitors (Germany, the Netherlands and France). This prompted the so-called "Doorn initiative", which involves unions in Germany, France, Belgium, the Netherlands and Luxembourg. The "Doorn initiative" is not an attempt at establishing transnational wage bargaining, but rather an initiative which through exchange of information and peer pressure aims at avoiding a process of "competitive" wage cuts, or competition between different national collective bargaining systems. The initiative has launched a "wage coordination formula" which defines the room for nominal wage increases as the sum of inflation and productivity growth[3]. The intention is to have a norm "protecting" the labour share, and ensure a level playing field to avoid undercutting. There is, however, some ambiguity as how to interpret the norm in respect to which measure to use for inflation and productivity. In recent years the norm has also been interpreted more flexible to take into account qualitative aspects like work environment, flexible working hours, training etc.

While the current status of these initiatives is open to discussion, they are interesting in the sense that they reflect recognition of increased interdependencies in wage formation. While transnational wage bargaining at present is an unlikely response, the initiatives are a way of trying to minimize the possible externalities involved in wage setting.

European wage setting institutions

European labour markets differ in a number of respects. The institutional set-up of wage bargaining differs across countries as does the relation between parties in the labour market and the political system[4]. Table 1 summarizes some indicators on labour market institutions across EU-countries.

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[3] Wage norms or formulas like this have a long history, and were e.g. a core element of the so-called Scandinavian inflation model.

[4] A difference between a regulation of labour markets based on legal rules and one based on acceptance of the regulations agreed upon by the parties in the labour market.

Table 1: Wage bargaining in EU 2001-2002

Country	Centralization[1]	Dates of agreement + duration[2]
AUS	0,648	1-year agreement
BEL	0,422	2-year agreement signed at the end of 2000
DEU	0,243	Most covered by 2 years contracts
DNK	0,341	4 year contracts for private sector (March 2000)
GRC	0,284	2-year agreement (May 2000)
ESP	0,343	Average of 3 year agreements
FIN	0,465	Incomes policy agreement 2001-02
FRA	0,079	1 year agreements
IRL	0,759	Partnership 2000-2003 (April 2000)
ITA	0,324	Different dates and durations
LUX	NA	No fixed dates
NLD	0,393	Different dates and durations
PRT	0,284	1-year duration
SWE	0,389	3-year agreement 2001-2004 (April)
GBR	0,141	Different dates and durations

Notes: 1) Based on the centralization index reported in Booth et al. (2000), the index is defined to belong to the unit interval, where 0 and 1 defines the lowest and highest degree of centralization/coordination of labour markets; 2) based on Mermet (2002) and EIRO.

Recently a tendency towards more decentralized wage setting has been observed in many countries (Austria, Belgium, Denmark, Finland, Germany, Sweden and the UK) although the opposite has also happened (Ireland) (see Boeri et al. 2001). However, although some decentralization of wage setting is taking place this is not necessarily tantamount to a deregulation of the labour market, and in some cases it is more appropriate to talk of "centralized decentralization" since some centralized control remains, despite more decentralized wage setting. This centralized element is important since it means that some overall norm building in wage setting remains, despite the increased decentralized leverage implied by these changes.

2.2 Wage developments

The development in the level and dispersion (measured by its standard deviation) of aggregate nominal wage increases for all EU-countries (except Portugal) for the period 1971 to 2001 is given in figure 1[5]. It is seen that average nominal wage increases have come down particularly in the 1990s during the preparation phase up to and after the establishment of the European and Monetary Union. Nominal wage increases have thus fairly quickly adapted to the low inflation environment, which must be taken as a sign that this process quickly established credibility. The dispersion in wage increases has also been reduced over this period, as could be expected given the lower average level of nominal wage increases. However, the coefficient of variation – the ratio of the standard deviation to the mean of nominal wage increases – has not been reduced. It is also interesting to observe that the reduction in the dispersion of wage increases is preceding the run up to EMU as there is a trend decline from

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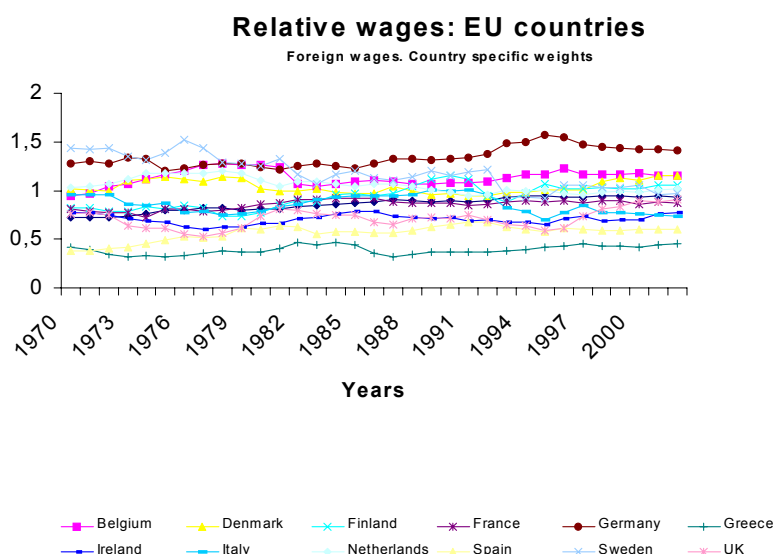[5] Wages are total wage costs per hour paid by firms.

the early 1980s and onwards (see also Hofer and Pichelman (1999) and Pichelman (2001)).

Figure 1

Average wage increases and volatility
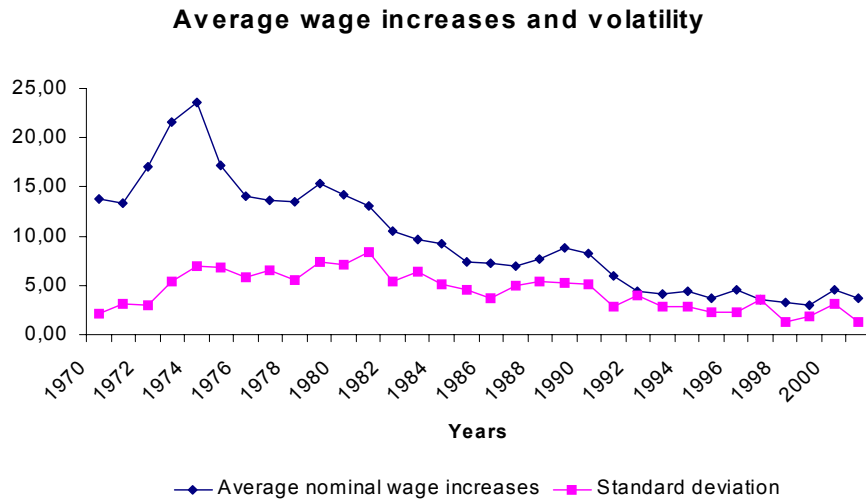
One way to assess the extent to which the competitive pressure is influencing wage setting is to consider whether there is a convergence in domestic wages to foreign wages (measured in domestic currency), i.e. relative wages or wage competitiveness. Figure 2 plots the relative wage for all EU countries (except Portugal) measured as the domestic wage relative to the country-specific foreign wage (defined as wages in other EU countries weighted by the importance these countries have for the particular countries' foreign trade). Stronger wage interdependence between trading partners due to market integration should be expected to make this relative measure approach unity (from above or below). Despite the richness of the figure some convergence is obvious for a group of core countries (excluding Germany, the upper line during the 1990s and Greece, the lower line). Figure 3 displays the development in the dispersion of relative wages or wage competitiveness for all countries included and by excluding Germany and Greece. Measured in this way there is clearly less dispersion today than at the start of the sample period, but it is equally clear that most of the convergence took place during the 1980s.

Figure 1

Relative wages: EU countries

Foreign wages. Country specific weights

Legend:
- Belgium
- Denmark
- Finland
- France
- Germany
- Greece
- Ireland
- Italy
- Netherlands
- Spain
- Sweden
- UK

One interpretation is that the real adjustment which has taken place happened during the 1980s, while the development since then more reflects the convergence in inflation, that is, during the 1990s there has been more nominal than real convergence.

That wage setting is being affected by integration is supported by empirical evidence reported in Andersen, Haldrup and Sørensen (2000). It is found that wages tend to move more similar between countries the stronger their trade links. In a time-varying parameter estimation of wage equations it is also found for a number of countries that wage formation has come to follow foreign wage developments more closely.

Evidence on the role of trade for wage formation is also found in a number of studies using trade measures (imports, exports etc) as a proxy for market integration. Bernhard and Jensen (1999a,b) find that exporting firms tend to have higher productivity and pay higher wages, with the causality running from productivity to exports. Other studies have found that import penetration tends to lower wages (see e.g. Revenga (1992), Nicoletti et al. (2001) and Jean and Nicoletti (2002). The fact that product market regulations are found to matter for labour market performance (see OECD 2002) is a further indication that product market integration may have important implications for labour market performance. This runs both via the deregulations following further product market integration, but also the indirect effects (see below) arising from easier market access, competition for market shares and options for relocation of production.

Figure 3

Standard deviation of relative wages
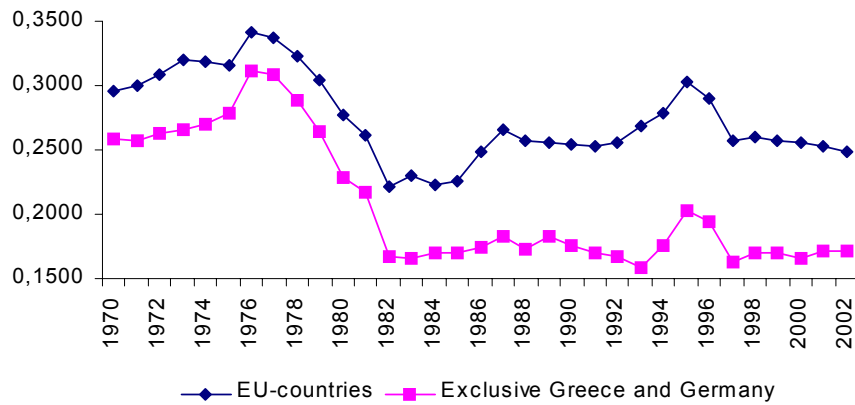
Business Cycles and Wage Adjustment

Another issue is the extent to which dispersion in wage changes across European countries reflects that business cycles are asymmetric. If so one should expect to find a positive relation between the dispersion of e.g. GDP growth rates and the dispersion in nominal wage changes. Figure 4 indicates that such a positive relation is present. However, the correlation between nominal wage changes and GDP growth is falling, since the correlation was 0.74 over the period 1971-80, 0.62 over the period 1981-1990 and 0.56 over the period 1991-2002. This suggests that nominal wage changes to a lesser extent than previously reflect differences in business cycle developments.

Accordingly, the empirical evidence suggests that there has been some strengthening of wage interdependencies with some convergence of nominal wage increases across European countries but also that wages to a lesser extent respond to domestic labour market conditions, that is, the nominal convergence which has been observed cf. figure 1, does not necessarily reflect real convergence.

Figure 4

Volatility of nominal wage changes and GDP growth:1971-2002

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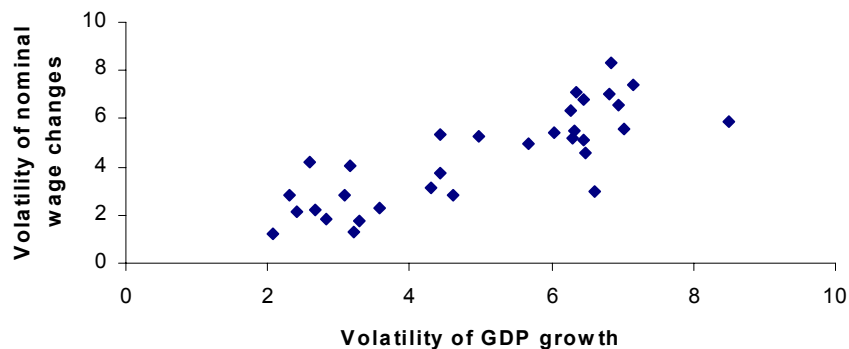
3 Product market integration and wage formation

A growing literature is exploring the effects product market integration may have on the wage formation process and also on the institutional setting of wage bargaining systems. The starting point of the literature is the recognition that product market conditions critically determine the room for wage bargaining between firms/employers and workers/unions (Dowrick (1989)). Imperfectly competitive markets leave rents and the bargaining process then settles the division of this rent between the two sides of the market depending on bargaining power and outside options. Moreover, product market conditions are crucial for the sensitivity of employment to wage changes, which is important for the aggressiveness of wage earners in wage bargaining since this determines the trade-off between wages and employment. This leads to the insight that product market integration can affect wage formation by affecting rents, threat points and the sensitivity of employment to wages.

To set the scene for an outline of the basic mechanisms, consider the following simple wage setting problem. Unions are determining wages with a concern for both real wages and employment, and taking into account that firms determine employment. This is the standard monopoly union variant of the right-to-manage model. It is well-known that it captures the qualitative implications of more rich bargaining models quite well. Specifically, assume that the union in country i has an objective function defined over wages and employment which can be written as

$$U(\frac{W_i}{P_i}, L_i) = \frac{W_i}{P_i}L_i - DL_i^{\rho} \quad ; \quad \rho > 1$$

where W_i is the nominal wage, P_i the consumer price index, and employment L_i determined according to the following labour demand relation

$$L_i = Z_i\left(\frac{W_i}{W_i^*}\right)^{-\theta} \quad ; \quad \theta > 1$$

where W^* is the relevant foreign wage (wage competitiveness matters for employment), and Z_i is an indicator of productivity. To simplify other variables of importance for employment are neglected to focus on the interdependencies arising in wage setting.

Solving for the optimal wage rate yields

$$\frac{W_i}{P_i} = \frac{\theta}{\theta - 1}D\rho(L_i)^{\rho - 1} \tag{1}$$

implying that the real wage demands are increasing in the level of employment. For the present discussion the interesting factor is $\frac{\theta}{\theta - 1}$, which gives the mark-up of real wages over the disutility of work.

Note that $\frac{\theta}{\theta - 1} \geq 1$ and decreasing in θ, that is, the less elastic labour demand is, the higher the mark-up.

From equation (1) one key implication of product market integration for wage formation follows readily. For reasons outlined below, international product market integration is likely to increase the elasticity of labour demand (θ increases), and the more elastic labour demand is the lower the wage demands at any employment level, that is, product market integration tends to induce wage moderation. Through this route product market integration may thus reduce wage "mark-ups", and therefore lead to a higher steady state level of employment.

Different mechanisms releasing this "elasticity-effect" have been considered in the literature. One important mechanism runs via market penetration in the context of so-called reciprocal dumping. The setting is one where domestic firms enjoy some rents because it is difficult or costly for foreign firms to penetrate into the market, and vice versa for foreign markets. The possibilities of reaping rents in product market affect wage setting and employment. However, lower trade frictions make market penetration easier, and it becomes more profitable for the domestic firm to expand its production for the foreign market to reap some of the rent present in that market, and vice versa for foreign firms with respect to the domestic market. The net result is thus penetration into both domestic and foreign markets, product market rents fall and as a consequence wages fall[6]. It is a further implication that wage interdependencies between national labour markets are strengthened (see e.g. Andersen and Sørensen (2000)). One main attraction of models of reciprocal dumping is that they can explain intra-industrial trade even in the form of two-way trade in identical commodities. A disadvantage is that the latter form of trade is seldomly observed, and that the model relies on Cournot competition (see Krugman (1995)).

An alternative approach focusses on comparative advantages and the fact that trade frictions may be an impediment to the most efficient allocation of production across countries. Lower trade frictions will thus imply a reallocation of production according to comparative advantages. Simultaneously, there will be an increase in imports and exports, alongside more specialization and an increase in intra-industrial trade (Andersen and Skaksen (2003)). An important point is that the elasticity of labour demand is larger than the elasticity implied by the underlying demands for products. The reason being that a change in (relative) wages will induce a change in market shares in both domestic and foreign markets. An important lesson from this type of model is the need to distinguish between the partial equilibrium effects and the general equilibrium effects. It is thus possible that the wage mark-up (wages relative to disutility of labour) decreases, but real wages and employment unambiguously increase in equilibrium. The latter reflects aggregate welfare gains from product market integration arising via further specialization and a better allocation of production given the comparative advantages prevailing. Note that comparative advantages prevailing at a given point in time can reflect the consequences of innovation activities, exploitation of economies of scale, gains from agglomeration etc.

The threat points in wage bargaining may also change in the process of product market integration. In principle this can go either to the benefit for workers and firms. In the short run the threat point of workers may be strengthened since an abruption of production may be more problematic in a more competitive and integrated product market (e.g. through the importance of reliable deliveries etc.). On the other hand the possibility of relocating production via FDI or outsourcing improves the threat point of firms. The latter effect is likely to be larger than the former. The possibility of relocation production through FDIs can be interpreted as either an improvement in the exit option or threat point of firms or as an increase in the wage elasticity of labour demand (in the medium to long run) and this may lower wage mark-ups along the lines explained above (see Driffill and Ploeg (1995)). Looking in more detail on the possibilities of relocating production or part of it via FDIs or outsourcing it is useful to make a distinction between horizontal and vertical investments (see Markusen et al. 1996). By horizontal investments is understood that

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[6] This results does not hold unambiguously, see e.g. Naylor (1998) and Andersen and Sørensen (2003).

production is split between similar plants located in different countries (labour markets), whereas vertical investments is characterized by production being split up in separate stages which are placed in different countries (labour markets). For horizontal investments (see Bughin and Vannini (1995), Zhao (1995, 1998) and Naylor and Santoni (1997)), the general finding is that it leads to wage moderation via essentially the elasticity effect discussed above. However, for vertical investments this need not be the case for the segment of the labour market attached to the production remaining in the home country. The reason is that domestic labour costs come to weigh less in overall costs and therefore it is possible that labour demand becomes less elastic and therefore wages increase for this group of workers, see Skaksen and Sørensen (2001).

Finally, international integration may be a separate cause of institutional changes in the labour market. Product market integration may affect the institutional structure through various routes. First, it is a straightforward implication that the effective degree of centralization in the labour market falls if product market integration leads to an increase in the number of firms competing in product markets, since this implies that the number of unions supplying labour to produce a certain type of commodities increases. This decrease in the effective degree of centralization has an ambiguous effect on labour markets, essentially because it depends on how the initial situation is positioned relative to an eventual hump-shaped relation between say wages and the degree of centralization (Danthine and Hunt (1994) and Driffill and Ploeg (1993)). Second, product market integration may be a reason for changing institutional arrangements in the labour market. Focussing on rent extraction Santoni (2002) shows that a reduction in product market rents (via improved possibilities for reciprocal dumping) following integration implies a reduction in the incentive for both unions and firms to have centralized wage bargaining. Along the same lines Gaston (2002) argues that the improvement in the outside opportunity of firms created by easier room for FDIs, outsourcing etc. can explain a shift towards more decentralized bargaining. Product market integration may also increase the costs of keeping wages out of line with productivity since domestic wage formation is less shielded from outside influences the higher various forms of trade frictions. Accordingly, a reduction in trade frictions increases the pressure for having a wage determination system allowing for wages to adjust to productivity, see Andersen (2002). Since this process tends to be accompanied by reductions in bargaining power in labour markets, it follows that decentralized wage formation may be observed simultaneously with a reduction in unemployment.

It is an implication of most of the arguments given above, if workers loose some bargaining power due to product market integration, some power can be regained by entering into transnational cooperative arrangements for wage setting. This shows that there is a stronger incentive for unions to cooperate, but it does not address the question how this should be implemented (a non-trivial problem given the substantial differences in labour market institutions across EU countries). However, the tighter integration of product market and its consequences for labour markets, may eventually be the process which puts momentum to the manifesto "workers in all countries unite"?

To sum up, the basic lesson of the work referred above is that product market integration very likely may lead to a reduction in the effective bargaining power of labour and therefore a reduction in "wage mark-ups". A consequence of this is an increase in the equilibrium level of employment, and therefore a reduction in the structural unemployment rate. In this sense product market integration is an indirect structural labour market reform. However, this does not address the equally important question of the adjustment of wages to shocks, and therefore the business cycle implications of tighter integration. An issue,

which especially within the EMU is important given the potential conflict between a common monetary policy and asymmetric shocks. Surprisingly, this is an issue which has not been devoted much attention in the literature.

4 Product market integration and labour market flexibility

The aim of the following is to review the consequences stronger wage interdependencies may have for both the level and volatility of employment.

Return to the illustrative wage setting problem considered in section 3. The wage relation (1) implies that there are wage interdependencies between trading partners. Considering the sensitivity of domestic wage setting to foreign wages measured by the elasticity of domestic wages to foreign wages we find

$$\frac{\partial W_i}{\partial W_i^*} \frac{W_i^*}{W_i} = \frac{\theta(\rho - 1)}{1 + \theta(\rho - 1)} > 0 \qquad (2)$$

Clearly this elasticity lies between 0 and 1, that is, an increase in foreign wages leads to an upward pressure on domestic wages. The intuition is straightforward, the higher the foreign wage, the higher can domestic wages be without jeopardizing competitiveness and thus employment. The important point is that this wage interdependence is stronger the more integrated the product markets (that is, the higher θ). In technical terms, the more product markets are integrated the stronger the strategic complementarity[7] in wage setting among labour markets.

The next observation concerns adjustments to shocks. The impact effect of a domestic productivity shock on domestic wage setting measured by the elasticity of wages to productivity is given as

$$\frac{\partial W_i}{\partial Z_i} \frac{Z_i}{W_i} = \frac{(\rho - 1)}{1 + \theta(\rho - 1)} > 0 \qquad (3)$$

Higher productivity leads to higher wage demands, because labour demand increases. Importantly, the sensitivity of domestic wages to domestic productivity shocks is smaller, the more product markets are integrated (the larger θ).

Combining the two observations made here in relation to equation (2) and (3) suggests that more integrated product markets imply that more weight in wage formation is attached to the wages of competitors and less to domestic market conditions. The reason is that when markets are more integrated (more elastic labour demand) the consequences of having e.g. wage developments out of line with that of competitors become more severe. However, when wage setting is more influenced by the wages prevailing elsewhere it follows that employment may become more sensitive to local (country-specific) shocks.

Building on this insight and taking it into an explicit macroeconomic setting would allow an analysis of the implications for adjustment and fluctuations. The model used in the following is a simple but standard macromodel (the details of

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[7] Strategic complementarity is defined as a positive relation between decision variables, cf. Cooper and John (1995). The case of a negative relationship between decision variables is denoted strategic substitutability.

the model are laid out in the appendix). It is a general equilibrium model for N countries trading in differentiated commodities. While the model is specific, the points illustrated are more general since they build on the insights above on product market integration and wage determination as well as a large literature on wage and price flexibility. As above the focus is on an increase in the substitution possibilities between domestic and foreign markets (firms) due to further product market integration (θ) causing demands to become more elastic. The reason for taking this indirect approach is that an explicit modelling of market integration becomes technically complicated, and is therefore avoided here for the sake of simplicity. Andersen and Skaksen (2003) present a model with integration interpreted as reducing various forms of trade frictions, and which lead to similar reduced form relations as used here. The following reports some general equilibrium results, and they are reported in the form of numerical illustrations which are more accessible than theoretical derivations. The illustrations are solely for pedagogical purposes and should not be interpreted as a calibration or an attempt at forecasting the quantitative implications of European integration. The details of the model and theoretical derivations are given in the appendix.

Employment level and volatility
The reasoning above and in section 3 suggests that there may be a trade-off between the steady state level of employment and its volatility, that is, product market integration may increase the employment level (lower structural unemployment) but increase employment volatility. Since the wage mark-up is reduced it is to be expected that the long run equilibrium level of employment goes up. At the same time the focus in wage setting shifts towards the wage of competitors (and therefore aggregate conditions within EU) and away from domestic conditions due to more strong wage interdependencies. Employment should therefore be expected to become more sensitive to asymmetric or country-specific shocks. The case of symmetric shocks is uninteresting in the present setting since all countries are assumed identical, i.e. interesting differences arise in the case of asymmetric shocks. Figure 5 shows how the steady state level of employment varies with the elasticity of demand, and figure 6 displays how the volatility of employment (measured by the standard deviation of relative employment) to country-specific shocks depends on this elasticity.

Figure 5: Steady state employment:
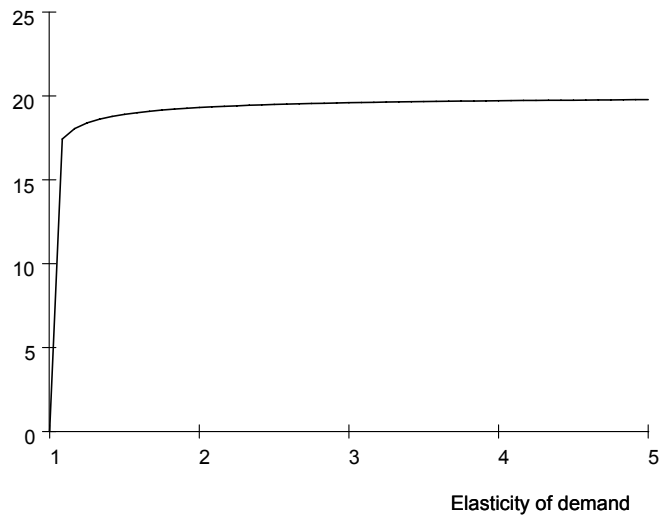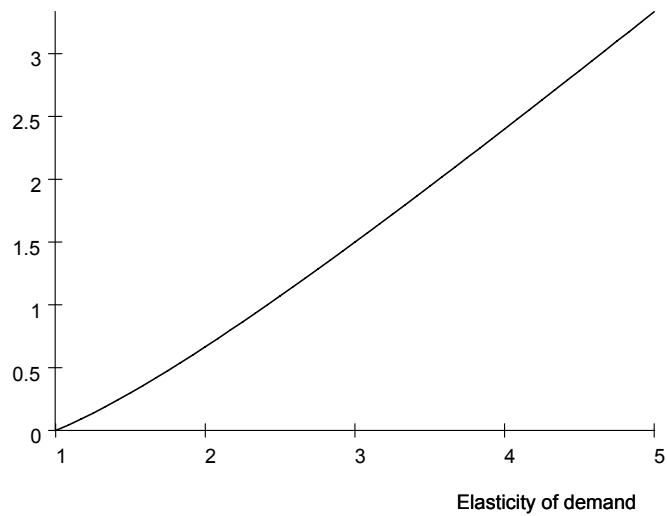Flexible wages and country-specific shocks

Figure 6: Volatility of employment:
Flexible wages and country-specific shocks

While the effect on steady state employment levels off, the volatility keeps increasing in the elasticity of demand (θ). Although the quantitative effects are to be interpreted cautiously the numerical illustrations do underscore one point, namely, that if the level effects are important so are the effects on volatility of employment to country-specific shocks. That is, even moderate increases in the elasticity (θ) can increase the volatility of employment relative to its mean significantly.

Figure 7: Relation of employment volatility to employment level

15
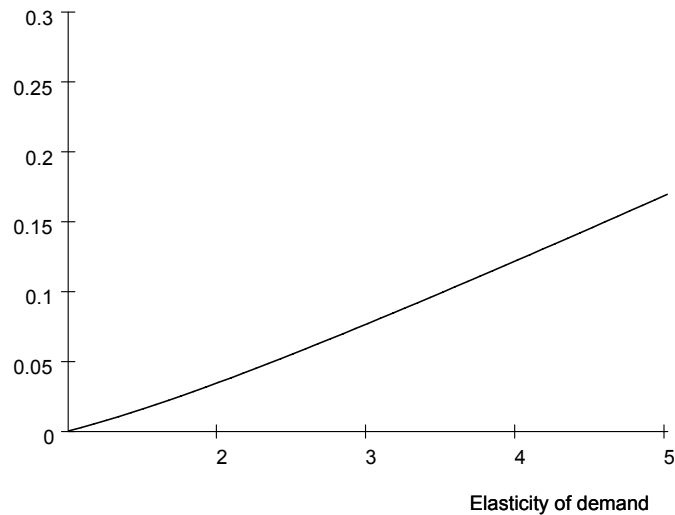
Nominal Rigidities: One-Period Contracts

If wages are rigid they will not take any burden of adjustment in the short run, and this will accordingly lead to higher volatility of employment. Figure 8 displays the volatility of employment to country-specific shocks in the case of flexible wages and rigid wages (the rigid wage is depicted by the solid line), and this confirms the standard observation that volatility is larger in the case with rigid wages. Important for the current discussion is the fact that this difference is increasing when product markets become more integrated, i.e. the consequences of rigidities in wage adjustment become larger, the more elastic labour demand is.

Figure 8: Employment volatility: Flexible and rigid wages
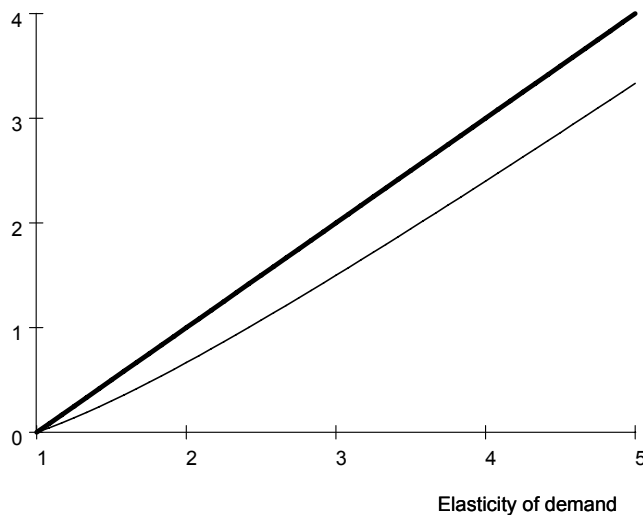
The case of one-period nominal contracting is also interesting since the wage rule implies (see Appendix) that the nominal wage increases are determined by expected consumer price inflation and expected changes in

16

productivity, which is basically the wage formula underlying the Doorn initiative, cf.. section 2. The present analysis brings out that such a wage formula contributes to larger employment variability precisely because it makes domestic wage developments insensitive to local labour market developments.

Basing wage formation on such norms is furthermore problematic for a number of reasons. First, there are problems in respect to definition of variables and whether the application of the formula should be backward (realized values of inflation and productivity) or forward (expected values of inflation and productivity) looking. It is also not clear whether it should be based on euro wide inflation or local inflation. Second, although the rationale for such norms is to ensure an unchanged income share to labour, such norms suffer from the problem that they tend to be self-fulfilling when firms adapt employment to ensure that the real product wage corresponds to the marginal productivity of labour. Ex post the norm would thus tend to hold[8], but imposing it in a rigid way ex-ante is not necessarily conducive for employment creation.

Whereas nominal contracting here simply is taken for granted it is worth pointing out that explanations of nominal rigidities running in terms of costs of changing wages/prices or of acquiring the relevant information on which to base adjustments find that the stronger the strategic complementarity the larger the incentive to maintain rigid wages (understood in the sense that the interval of realizations of shocks supporting rigid wages increases), see e.g. Ball and Romer (1991). That is, with strong wage interdependencies it is more likely that wages remain rigid in a given labour market if they are rigid in other labour markets and vice versa. This implies that wage rigidities may be further strengthened as a consequence of product market integration.

Nominal Rigidities: Non-coordinated wage determination
Current wage setting arrangements in Europe must be characterized as highly non-coordinated, cf.. table 1. Different labour market institutions mix with a variety of contract lengths etc. and this implies that wage decisions are not coordinated neither in time nor space. Non-coordinated wage setting may have important implications for the adjustment process over time to shocks as has been documented in models featuring the coordination problem arising when e.g. wage decisions are not coordinated in time (see e.g. Taylor (1999), Andersen (1998), Chari, Kehoe and McGrattan (2000)). The simplest case of non-coordinated wage setting is that of asynchronized two-period contracts[9], which has been extensively analysed in recent work on the propagation mechanisms in business cycle models.

A recent strand of the business cycle literature has addressed the role of price and wage rigidities in causing persistence in the adjustment process. Specifically, it has been analysed what role asynchronized nominal wage (or price) setting has for the adjustment to shocks over time (see e.g. Taylor (1999)). It is still open to debate how quantitatively strong the persistence generated solely by asynchronized nominal contracts is (see e.g. Chari, Kehoe and McGrattan (2000)), but there is no doubt that non-coordinated wage (and price) decisions is an important cause of persistence in the adjustment process. For the present debate the important point is that stronger interdependencies in wage and price decisions strengthen the persistence generated by e.g. non-coordinated wage adjustments. In a closed economy model Erceg (1997) shows that the closer the substitution between different types of labour and therefore the

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[8] In the standard text book case of a Cobb-Douglas production technology this holds precisely and the wage share is constant irrespective of wage setting.

[9] Extending to overlapping n-period contracts do not seem to have important quantitative implications, see e.g. Andersen and Beier (2003).

stronger the wage interdependencies between the wage setting groups, the stronger the persistence in the adjustment process. In an open economy context it is shown in Andersen and Beier (2003) that the stronger the wage and price interdependencies the more persistent the adjustment to shocks. Since product market integration is going to strengthen wage interdependencies between labour markets in different countries, it follows that a consequence of this may be more persistence or sluggishness in the adjustment to shocks. This is yet another channel through which product market integration may reduce labour market flexibility, although it may contribute to an increase in the steady-state employment level (or equivalently a reduction in structural unemployment).

To illustrate this point consider the implications of non-coordinated wage determination across European countries by introducing two-period staggered contracts in the model used here for illustrative purposes (see appendix for details). As shown in the appendix an increase in the demand elasticity - the proxy for product market integration used here - implies that wage adjustment becomes more sluggish in the sense that current wages come to depend more strongly on past wages (despite forward looking expectations formation), that is, the adjustment process to shocks becomes slower and therefore the consequences of various shocks become more persistent. Figure 9 shows the impulse response function for wages to a permanent change in productivity, and it is seen that wages react more sluggishly to changes in productivity when demand is more elastic, i.e. when product markets are more tightly integrated.
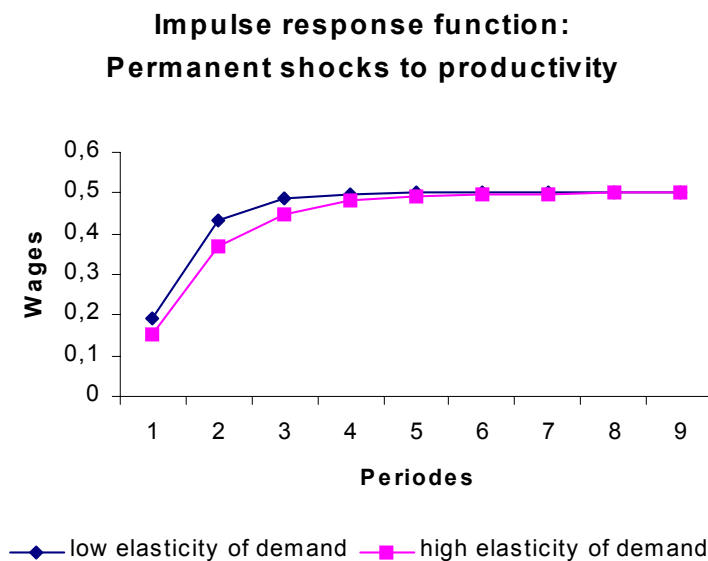
Figure 9

Impulse response function:
Permanent shocks to productivity

Figure 10

18

**Impulse response function:
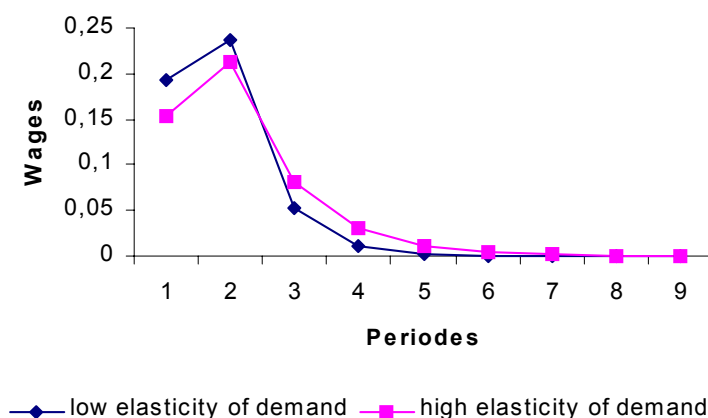temporary shock to productivity**

Figure 10 displays the impulse response function to a temporary shock, and it is seen that wage on impact reacts less and the adjustment process is slower the more elastic is in demand. An implication is that wages are less sensitive to temporary changes but also more sluggish to overcome the consequences of such changes, the more integrated product markets are.

To sum up, it has been shown that effects of product market integration tending to increase the elasticity of labour demand tends to increase the mean level of employment but also it volatility and the persistence in the adjustment process. An interesting issue for further research is whether these effects also arises when it is taken into account that international integration may be one of the forces for more decentralized wage formation (see section 3). Moreover, empirical work on changes in demand elasticities is important.[10]

5 Concluding remarks

Product market structures are important also for labour market performance, and accordingly product market integration may have implications for labour market performance, even if labour is not very mobile across European labour markets. Labour market performance (structural unemployment, flexibility etc.) is of utmost importance in its own right. Moreover strong interdependencies are being built between integrating economies and therefore labour market performance in one country is of importance to its trading partners through various channels. A further aspect is that for countries within the euro area there may be a need for greater wage flexibility to compensate for lack of national monetary policy instruments to cope with country-specific shocks.

For all of these reasons it is an important question whether there are forces inherent in the integration process which work to improve labour market performance. Would the adaption to the consequences of integration and in particular product market integration be alike a structural labour market reform

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[10] Slaughter (2001) presents evidence on changes in labour demand elasticities and find some evidence that they have increased. However, the results arises from estimating conditional (on output) labour demand relations implying that the product market link important to the discussion in this paper and the general debate about consequences of product market integration for labour markets is ruled out.

leading to improved labour market performance, or would labour market rigidities and heterogeneities across European countries be an impediment to reaping the benefits of further integration and be an obstacle to the smooth functioning of the euro area.

Product market integration can be expected to have mixed consequences for labour market performance. On the one hand tighter integration and product market competition may be expected through various channels to lower wage mark-ups and therefore lead to an increase in the employment level (reduction in structural unemployment). On the other hand stronger wage interdependencies across labour markets follow from the same mechanisms and this tends to foster wage rigidities and persistence (given asynchronized wage setting) which in turn may lead to more volatility in employment. As a consequence asymmetries in business cycle fluctuations across integrating countries may be reinforced despite stronger trade links.

Accordingly, product market integration only resembles an (implicit) structural labour market reform in one dimension - it is good news for the structural unemployment level, but it is bad news for business cycle fluctuations since it implies that activity becomes more sensitivity to country-specific shocks.

Product market integration will therefore not eliminate the need for structural labour market reforms and the tension concerning stabilization of (asymmetric shocks) may increase. It is sometimes argued that the main issue is to make wage developments across European labour markets consistent with the monetary policy objective of low and stable inflation. This is, however, a very imprecise yardstick by which to evaluate the importance of labour market structures. First, to the extent that the monetary policy objective is pursued rigorously the issue is not to make wage development consistent with low and stable inflation, but rather at what level of unemployment wage formation is consistent with the inflation target. Second, informal coordination on wage setting via e.g. strong norm building in wage setting (like the formula or norm calling for wage increases to equal inflation plus productivity growth) may be detrimental to more smoothly working labour markets, since it reinforces wage interdependencies in wage setting, and therefore leads to large sensitivity of employment to country-specific or asymmetric shocks. Such norms may thus be conducive to nominal convergence but come at the cost of less real convergence.

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